

In the claims:

5 1 - 10 (cancelled claims)

 11 (presently amended) A depressed voltage collector
for connection to a sub-millimeter electromagnetic wave
device containing a cathode and a body generating a
10 rectangular sheet electron beam of electrons traversing into
the collector where energy is recovered from the electron
beam, said collector comprising:

 an electrically conductive dissipation cavity;

 a front wall located on one side of said dissipation
15 cavity having a rectangular aperture to allow passage of
said rectangular sheet electron beam into said interior
cavity;

 a conductive reflector electrically and mechanically
attached to said interior cavity in said enclosure, opposite
20 said rectangular aperture, positioned at an angle to said
incident rectangular sheet electron beam to reflect the
electrons into the interior cavity; and

 means for electrically energizing said collector such
that the total voltage difference between said collector and
25 said cathode is significantly less than the voltage
difference between said cathode and said device body

where said body includes a magnetic field oriented axially to said sheet electron beam, and the strength of said magnetic field is substantially the same in said body as in said collector.

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12-15 (cancelled claims)

16 (presently amended) A single stage depressed voltage collector for connection to a sub-millimeter electromagnetic wave device containing a cathode and a body generating a rectangular sheet electron beam of electrons traversing into a collector where energy is recovered from the electron beam, said collector comprising:

an electrically conductive dissipation cavity;
15 a front wall located on one side of said dissipation cavity having a rectangular aperture to allow passage of said rectangular sheet electron beam into said interior cavity;

a conductive and substantially planar reflector
20 electrically and mechanically attached to said interior cavity in said enclosure, opposite said rectangular aperture, positioned at an angle to said incident rectangular sheet electron beam to reflect the electrons into the interior cavity; and

25 means for electrically energizing said collector such that the total voltage difference between said collector and

said cathode is significantly less than the voltage difference between said cathode and said device body.

17-19 (cancelled claims)

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20 (New Claim) An electrically conductive collector for an electron beam comprising primary electrons traveling from a cathode, said electron beam having an axis, said conductive collector including:

10 an entrance aperture for receiving said electron beam;

a substantially planar impinging surface for interacting with said primary electrons, said interaction generating backscattered primary electrons from said electron beam and optionally secondary electrons from said

15 impinging surface;

said impinging surface angled with respect to said axis, thereby directing said backscattered primary electrons away from said electron beam;

a dissipation cavity for receiving said backscattered
20 primary electrons and said secondary electrons;

where said primary electrons and said backscattered primary electrons have substantially linear trajectories;

and a voltage potential is applied between said conductive collector and said cathode.

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21 (New Claim) The collector of claim 20 where said electron beam and said entrance aperture have a cross section which is rectangular.

5 22 (New Claim) The collector of claim 20 where said electron beam cross section is elliptical.

23 (New Claim) The collector of claim 20 where said electron beam has an aspect ratio of at least 10:1.

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24 (New Claim) The collector of claim 20 where said beam collector is made from graphite.

25 (New Claim) The collector of claim 20 where said
15 dissipation cavity is made from graphite.

26 (New Claim) The collector of claim 20 where said impinging surface is graphite.

20 27 (New Claim) The collector of claim 20 where said electron beam and said collector are in a uniform magnetic field having an orientation parallel to said axis.

28 (New Claim) The collector of claim 20 where said
25 voltage potential results in a minimum number of said primary electrons reflecting to said entrance aperture.

Amendment for: Depressed Collector for Electron Beams by Ives et al. s/n 10/038,016

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29 (New Claim) The collector of claim 20 where said
electron beam travels through a beam tunnel having an axial
magnetic field, and said axial magnetic field is
substantially uniform in said beam tunnel and said
5 collector.

30 (New Claim) An electrically conductive collector for
an electron beam traveling from a cathode through a beam
tunnel to said collector, said beam tunnel and said
10 collector having a common magnetic field parallel to said
electron beam, said collector including:

a entrance aperture for receiving said electron beam;
a substantially planar impinging surface for
interacting with said electron beam, said interaction
15 generating backscattered primary electrons from said
electron beam and optionally secondary electrons from said
impinging surface;

a dissipation cavity for receiving said backscattered
primary electrons and said secondary electrons;
20 where said backscattered primary electrons and said
secondary electrons are directed away from said beam tunnel;
and a voltage potential is applied between said
conductive collector and said cathode.

25 31 (New Claim) The collector of claim 30 where said
electron beam and said entrance aperture have a cross
section which is rectangular.

Amendment for: Depressed Collector for Electron Beams by Ives et al. s/n 10/038,016

32 (New Claim) The collector of claim 30 where said electron beam cross section is elliptical.

5 33 (New Claim) The collector of claim 30 where said electron beam has an aspect ratio of at least 10:1.

34 (New Claim) The collector of claim 30 where said beam collector is made from graphite.

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35 (New Claim) The collector of claim 30 where said dissipation cavity is made from graphite.

15 36 (New Claim) The collector of claim 30 where said impinging surface is graphite.

37 (New Claim) The collector of claim 30 where said primary electrons have trajectories which are substantially linear from said entrance aperture to said impinging
20 surface.

38 (New Claim) The collector of claim 30 where said electron beam is formed from primary electrons and said voltage potential results in a minimum number of said
25 primary electrons reflecting to said cathode.

39 (New Claim) The collector of claim 30 where said backscattered primary electrons have trajectories which are substantially linear.

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40 (New Claim) An electrically conductive collector for a large aspect ratio annular electron beam traveling from a cathode, through a beam tunnel, and to said collector;

said annular electron beam having an axis and an
10 annular electron density beam profile perpendicular to said axis including said electron density from a first radius to a second radius, said conductive collector including:

an annular entrance aperture for receiving said electron beam;

15 an impinging surface which is circularly symmetric about said axis, said impinging surface for interacting with said electron beam, said interaction generating backscattered primary electrons from said electron beam and optionally secondary electrons from said impinging surface;

20 a dissipation cavity for receiving said backscattered primary electrons and said secondary electrons;

said backscattered primary electrons and said secondary electrons directed away from said beam tunnel;

and a voltage potential is applied between said
25 conductive collector and said cathode.

41 (New Claim) The collector of claim 40 where said
beam collector is made from graphite.

42 (New Claim) The collector of claim 40 where said
5 dissipation cavity is made from graphite.

43 (New Claim) The collector of claim 40 where said
impinging surface is graphite.

10 44 (New Claim) The collector of claim 40 where said
electron beam and said collector are in a uniform magnetic
field having an orientation parallel to said axis.

45 (New Claim) The collector of claim 40 where said
15 electron beam is formed from primary electrons and said
voltage potential results in a minimum number of said
primary electrons reflecting to said cathode.

46 (New Claim) The collector of claim 40 where said
20 electron beam travels through a beam tunnel having an axial
magnetic field, and said axial magnetic field is
substantially uniform in said beam tunnel and said
collector.

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